Environmental Water Account Acquisition Strategy For 2005

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EWA Acquisition Strategy For 2005

I. Executive Summary

The Environmental Water Account (EWA) enters its fifth year of operation in 2005. The Management Agencies (U.S. Fish and Wildlife Service, NOAA Fisheries, California Department of Fish and Game) and the Project Agencies (U.S. Bureau of Reclamation, California Department of Water Resources), jointly administer the EWA. These five agencies are collectively referred to as the "EWA Agencies." This paper sets forth their formal strategy for the acquisition of assets for the EWA program for 2005.

Recent developments in proposed State Water Project (SWP) and Central Valley Project (CVP) operations will affect the EWA in coming years, including: a proposal to more closely integrate the operations of the two projects; a proposal for EWA to provide additional coverage to supplement Central Valley Project Improvement Act (CVPIA) Section 3406 (b)(2) actions under certain conditions; the proposal to increase the regulatory limit on pumping at the Harvey O. Banks Delta Pumping Plant from 6,680 cubic feet per second (cfs) to 8,500 cfs as covered in the CALFED Record of Decision (CALFED ROD) in 2000; other improvements to the south Delta; and a revised Operations Criteria and Plan (OCAP) for the CVP and SWP. These changes will require a revised EWA program to properly address the fishery and water supply reliability needs under changed conditions.

These changes will be evaluated and addressed in 2005 and subsequent years. With the exception of increased integration of SWP and CVP operations, the above changes are not expected to occur during the 2005 operational year (October 1, 2004 through September 30, 2005, which corresponds with California's water year) of the EWA. The EWA Agencies will be pursuing acquisitions consistent with existing EWA operations and National Environmental Policy Act (NEPA)/California Environmental Quality Act (CEQA) coverage provided by the EWA Environmental Impact Statement/Environmental Impact Report (EIS/EIR) Record of Decision (ROD)/Notice of Determination (NOD), including new environmental, conservation and mitigation measures, and will be keeping the potential needs of a longer-term EWA in mind as they develop agreements.

In September 2004, the EWA Agencies signed an agreement to continue to implement the EWA through December 31, 2007. The agreement specifies that the EWA will be implemented as described in the preferred alternative (Flexible Purchase Alternative) analyzed in the EWA Final Environmental Impact Statement/Environmental Impact Report (EIS/EIR) dated January 2004. The EWA Operating Principles Agreement was extended through December 31, 2007.

The EWA began water year 2005 with an estimated debt in San Luis Reservoir of about 15 thousand acre-feet (TAF) from 2004 operations. Of that amount, about 17 TAF was debt owed to the CVP and about 2 TAF was credit to the SWP. In addition, EWA had about 20 TAF of water year 2004 upstream-of-Delta purchases that could not be captured at the Delta pumps and that were later released for instream use. The EWA agencies purchased sufficient assets to offset estimated debt, but were unable to pump all of the transfers due to Delta operational limitations and transfer timing. (Additional debt was incurred at both the CVP and SWP export facilities in December and February and was paid in early 2005 when San Luis Reservoir filled, "spilling" its debt to the CVP and SWP.)

The EWA Project Agencies will continue a strategy of acquiring necessary water supplies and related assets at minimum cost to provide for fish protection and recovery, implementing the concept of functional equivalency as established in the CALFED ROD to help reduce costs.

The concept of functional equivalency as applied to water acquisitions involves maximizing water purchases upstream of the Delta consistent with the Projects' capability to convey EWA water across the Delta during the summer transfer period, July-September. Options would be employed for the upstream purchases with spring call dates, and the amount of the lower cost upstream-of-Delta purchases would reflect the approximate cross-Delta transfer capacity.

The remainder of the water assets would be acquired south of the Delta (in the export service areas). Source shift agreements totaling 100 thousand acre feet (TAF) would be negotiated and activated only as needed in 2005. Other services, including storage capability, exchanges, and predelivery arrangements to protect EWA assets in San Luis Reservoir at year-end would be negotiated as the budget permits.

Multi-year agreements will be sought for many of the EWA assets and services beginning this year. The Final EWA EIS/EIR addresses the continued operation of the EWA through 2007. In addition, the EWA Agencies are actively discussing the continuation of a longer-term EWA over the next 10-25 years in conjunction with environmental review and approval of DWR's South Delta Improvement Program.

Water needs for 2005 are developed based on assumed fish actions (Delta pumping curtailments, in-stream flow and Delta outflow augmentations, cross-channel gate operational changes, and in-stream flow temperature enhancements) that will be implemented by the EWA agencies. Placeholders of about 300 TAF have been assumed for potential fish actions in 2005, based on estimates developed in March 2005. The fish actions would be supported by purchases (fixed assets; see Table 1, below); operational (variable) assets (about 64 TAF estimated as a result of debt spill retiring 2004 carryover debt and retiring the debt from a February 2005 pumping curtailment); activation of the source shift agreement if required (up to 100 TAF); and borrowing from the CVP and SWP if required.

Table 1 summarizes the proposed 2005 EWA acquisition program. The purchased water component of the EWA (Total Delivery Goal in Table 1) is higher than that established in the CALFED ROD based on the experience of the last four years, modeling analysis, and operational gaming for the EWA under current conditions.

Table 1
Summary of EWA 2005 Purchase Goals

Year Type	Approximate SWP Allocation	Total Delivery Goal[1]	UOD[2] Pumped X-Delta	Usual UOD Purchases	Usual SOD[3] Purchases	Plus Carryover Debt From 2004[4]	Total 2005 Purchase Target
Critical	< 40%	210	210	260	0	0	260
Dry	< 55%	220	220	275	0	0	275
Below Normal	55-75%	220	115	145	105	0	250
Above Normal	75-90%	220	60	75	160	0	235
Wet	90-100%	230	60	75	170	0	245

(1) Goal for delivering purchased water assets to the projects to compensate for operational curtailments.
(2) Upstream of the Delta
(3) South of the Delta (also known as the Export Service Area)
(4) Carryover debt of 17 TAF erased in March 2005

In addition to acquisitions, it is estimated that the EWA could obtain approximately 50 TAF of water under the operational (variable) assets provided in the CALFED ROD. The EWA may be able to gain additional operational assets in wetter years if San Luis Reservoir fills and conditions allow the EWA to pump Delta water to repay (or "spill") its water debts, assuming additional debt has been developed in San Luis or Oroville Reservoirs at the time such pumping is possible.

The EWA Agencies would continue to coordinate acquisition activities with Reclamation's water purchases for instream flows and state and federal wildlife refuges pursuant to the Central Valley Project Improvement Act (CVPIA) Section 3406 (b)(3). The program would also continue to be coordinated with the DWR Dry Year Program and other transfer programs including the Drought Risk Reduction Investment Program. The Sacramento Valley Water Management Program (SVWMP, formerly known as Phase 8) is not anticipated to transfer any water in 2005.

The EWA Agencies will use source-shifting arrangements and/or project debt to carry EWA debt above the delivery goals into the following year if it is needed. This 100 TAF of debt carryover capability is an important aspect of achieving the EWA flexibility envisioned in the CALFED ROD because it can increase asset availability in some years and increase the potential for debt erasure in very wet years after San Luis Reservoir fills.

In 2005, the EWA will actively seek multi-year agreements for assets and services in accordance with the EWA EIS/EIR ROD and NOD, which were signed in March 2004. Longer-term arrangements are anticipated to provide the EWA with greater certainty, lower long-term costs, and enhanced flexibility and reliability.

The EWA is interested in diversifying its sources of assets to lessen its impact on the water market; provide opportunities for using multiple sources; minimize cost; coordinate with other transfer programs, including refuge programs; and maximize the effectiveness of CALFED Program investments. This diversification includes both SWP and CVP sources of replacement water south of the Delta. The EWA in 2002, 2003, and 2004 made reductions in exports at both the CVP and SWP export facilities and will do so in the future. Partnerships between EWA and both CVP and SWP users south of the Delta ease the administrative tasks of replacing these water supplies for each project, respectively.

II. Introduction

The Environmental Water Account (EWA) is a cooperative management program whose purpose is to provide protection to the fish of the Bay/Delta Estuary through environmentally beneficial changes in the operations of the Central Valley Project (CVP) and the State Water Project (SWP) at no uncompensated water cost to the CVP and SWP project users. The EWA is a key component of CALFED's Water Management Strategy, funded thus far through State and federal public funds, to address declining fish populations and unreliable water supplies.

The EWA, when taken together with the other aspects of the CALFED Bay/Delta Program, provides part of the resources required for the protection and recovery of critical fish species of the Bay Delta Estuary and provides assurances that the water supplies of the CVP and SWP will not be reduced to provide that protection.

The Management Agencies, which are the U.S. Fish and Wildlife Service, NOAA Fisheries, and the California Department of Fish and Game, and the Project Agencies, which are the U.S. Bureau of Reclamation (Reclamation) and the California Department of Water Resources (DWR), are jointly responsible for implementation of EWA. This document focuses on the acquisition of the EWA assets necessary to achieve its purpose and objectives.

III. Asset Acquisition Strategy: Goals and Objectives

This section of the document sets forth the proposed goals and objectives for the acquisition of assets for the EWA in 2005. It is intended as an overview of the framework for the EWA acquisition program for 2005 and future years. It provides information on how the program expects to mature and develop long-term stability. These goals are consistent with the Final EWA EIS/EIR on the EWA Program (March 2004). Implementation of other goals may require additional CEQA and NEPA coverage, including separate CEQA and NEPA actions by the Project Agencies, although the planning activities necessary to bring the goals forward to a decision have already been initiated. The asset acquisition program strategy for 2005 incorporates the following goals and objectives:

- Define the purchase strategy
  - Define the placeholders necessary to meet the EWA's needs
  - Define the asset purchase targets for 2005 by fall 2004 in conjunction with estimated needs for future years
  - Define the concept of functional equivalency for EWA assets and adjust purchase targets appropriately
  - Identify participants, constraints, opportunities, and funding needs and sources

  - Define the asset management strategy for various potential operational scenarios

- Acquire water at the most effective unit cost
  - Approach prospective sellers with clearly defined needs and clear understanding of adjusted targets that reflect functional equivalency
  - Purchase upstream-of-Delta water to the extent cross-Delta conveyance is assured in any hydrology
  - Negotiate options for additional amounts of lower-cost upstream-of-Delta water that can be exercised when additional cross-Delta conveyance is available in drier years
  - Negotiate SWP allocation triggers into south of the Delta (export service area) purchases to provide the required balance of EWA assets when the EWA's cross-Delta transfer capacity is constrained in wet years
  - Coordinate the option and purchase agreements to maximize upstream-of-Delta purchases when Delta conveyance capacity will be available (in drier years), supplementing with south of the Delta purchases only to the degree necessary when transfer capacity is restricted, with decision dates late enough to assure meeting asset acquisition targets
  - Negotiate asset purchases in the fall when possible and execute contracts before hydrology can become an issue
  - Structure agreements over longer terms, subject to funding commitment constraints and environmental coverage, to lock in pricing and simplify future negotiations
  - Negotiate a flexible option agreement for the source shift and exercise only when needed
  - Continue to pursue actively all opportunities to acquire operational (variable) assets

- Expand the asset base
  - Prepare and distribute formal notification of anticipated water needs to all potential willing sellers
  - Request additional funding or modifications to "encumbrance" requirements to pursue more option agreements, and increase the ability to have numerous options without encumbering funds until required
  - Initiate negotiations with additional agencies to increase the competition for inclusion as a seller to the EWA program
  - Pursue acquisitions that can also provide flow increases, temperature modification, and other beneficial actions, consistent with EWA purposes

- Improve flexibility
  - Pursue longer-term arrangements consistent with the Final EWA EIS/EIR in anticipation of a decision to extend the EWA Program beyond the four-year initial phase

  - Pursue the planning activities leading to an approval for the direct purchase of SWP contract water that has been allocated to and would otherwise be put to beneficial use by the contracting agency, including carryover water
  - Pursue participation in SWP programs such as Turn-Back Pools, recognizing that this action would probably require additional analysis under CEQA
  - Negotiate purchases in both CVP and SWP service areas
  - Make the negotiation and contracting process as smooth and swift as possible
  - Increase borrowing from the SWP and CVP when prudent and appropriate

- Protect assets
  - Negotiate groundwater banking arrangements, exchange agreements, and south-of-Delta storage agreements to protect EWA assets
  - Negotiate exchange agreements to include both multi-year wet-dry exchanges that help the EWA and water users meet their peak water needs in wet and dry years, respectively, and wet year exchanges with water users to reduce losses when EWA assets are threatened with spill in San Luis Reservoir
  - Negotiate carryover clauses where appropriate to allow an EWA asset to remain in place and be transferred in a future year

- Continue coordination with other water purchase programs
  - Coordinate with CVPIA Level 4 refuge purchases and in-stream flow purchases to ensure the priority accomplishment of both each year
  - Coordinate purchases for the EWA and dry year programs to mitigate competition between the programs and allow shifting of assets between programs as needed
  - Coordinate purchases with other CALFED water purchase programs

- Maximize the effectiveness of CALFED Program investments
  - Enhance water bond grant selection criteria to encourage infrastructure that will support future EWA success
  - Propose EWA participation as potential partner with other applicants (combine existing funds with grant funding)
  - Propose EWA as independent applicant (augment existing funds with additional grant funds)

- Support development of a long-term (10-25 year) extension of the EWA Program
  - Continue analyses and planning to define the fish needs, water purchase goals, operational characteristics, cost estimates, and financing plans necessary to continue operation of the EWA into the future consistent with DWR's South Delta Improvements Program (SDIP) and the CVP-SWP OCAP
  - Support development of NEPA/CEQA documentation and related tasks for an extension of the EWA into the future past 2007

- Support continued planning of CALFED storage projects with the goal of providing long-term assets for the EWA
  - Continue analyses and planning to define the potential role of an EWA in the storage programs and define the benefits that could accrue to the EWA from the respective storage projects

IV. Supporting Analysis for the EWA Acquisition Strategy

This section provides the supporting analysis to define the rationale behind the acquisition strategy and provide background information on the EWA. A summary of 2001 through 2004 EWA operations is presented in Section VI.

A. EWA Context

The EWA operates within the water rights permits and operational capabilities of the SWP and CVP. This special arrangement and the EWA's purchased (fixed) and operational (variable) assets are specifically set forth in the EWA Operating Principles Agreement and the CALFED ROD, which was signed by the Secretary of Interior and the Secretary of the California Resources Agency, as well as others. Managers of the five EWA Agencies signed the EWA Operating Principles Agreement.

The CVP and SWP operate fully within the constraints defined by California State Water Resources Control Board's Decision-1641, the applicable biological opinions, and all other regulatory requirements. Although an independent CALFED program, the EWA can be viewed as a way for implementing CVP and SWP operational changes to protect and help recover sensitive fish species of the Bay/Delta estuary. As explicitly provided in the CALFED ROD and the EWA Operating Principles Agreement, the SWP and CVP use their water rights as necessary to acquire EWA assets.

EWA assets are to be stored and delivered through the SWP and CVP facilities. The EWA Operating Principles Agreement, Article II.2, provides that EWA assets may be stored in project reservoirs, provided the projects do not incur any adverse operational impacts. The EWA may also use excess capacity in SWP or CVP conveyance facilities, on an equal priority with Level 4 refuge water acquisitions mandated by the CVPIA. This priority is higher than transfer water for non-project entities.

Although the EWA is not included in the CVP authorizations and is not a SWP contractor, through the EWA Operating Principles Agreement the Project Agencies have conferred an operating status upon the EWA that is a higher priority than third parties in the use of project facilities. According to the 2005 Interim Protocols for the EWA, for operational purposes the storage and conveyance of EWA water has a lower priority than CVP/SWP Project water but a higher priority than non-project water. Therefore, with the exception of the costs (capital, operations and maintenance and rehabilitation, and energy) associated with the use of project facilities to store and deliver EWA water, EWA water has more operational flexibility than non-project water that is stored or

conveyed on behalf of third parties. For cost accounting purposes, the EWA's use of CVP/SWP facilities is subject to CVP/SWP power and facility costs, as applicable. Such accounting is comparable to that applied to non-project users or third parties.

Both SWP and CVP contractors and the environment benefit from the operation of EWA. A fully functional EWA provides commitments that there will be no additional reductions in project water supply deliveries relative to the regulatory baseline as a result of actions to protect at-risk fish species.

Over the next year several actions will affect the future direction of the EWA. These actions include:

- Planning for expansion of permitted pumping capacity at the Banks Delta pumping plant from 6,680 cfs to 8,500 cfs, as part of DWR's SDIP;
- Permitting actions and CEQA/NEPA documentation for the SDIP
- Completion of the CVP-SWP OCAP and subsequent consultation under the federal ESA and California Endangered Species Act (CESA)
- Consideration of potential increased coverage by EWA for certain CVPIA Section 3406 (b)(2) expenditures for fishery protection;
- Probable increased cross-Delta transfer activity related to increasing demands for water supply in California

B. EWA Strategy: Tie Water Purchases to Hydrologic Conditions to Minimize Costs

The CALFED ROD establishes EWA purchased (fixed) asset targets at 185 TAF with 35 TAF coming from sources upstream of the Delta and 150 TAF coming from sources south of the Delta or the functional equivalent of these assets. In reality, there is more water available for transfer from areas upstream of the Delta, and at a lower cost, than from areas south of the Delta. Strict adherence to the 35/150 TAF CALFED ROD requirements has the potential to place an avoidable cost burden on the EWA. The EWA has taken advantage of the functional equivalence concept to purchase a greater portion of the water from upstream sources and thereby acquire the purchased assets with available EWA funding.

The amount of water available for transfer is typically greater from areas upstream of the Delta than areas south of the Delta, especially in dry years. This difference is reflected in the market rates (unit price paid to willing sellers) in these two areas. The differences in water prices upstream and south of the Delta are not simply the costs of transporting water across the Delta, but also reflect a structural difference in the water economies of these two areas.

One reason for the higher south-of-Delta cost is that the EWA's 2001 and 2002 water purchases in SWP service areas south of the Delta were restricted to the relatively limited supply of previously banked groundwater. Banked groundwater has been

purchased, transported, banked, and must then be pumped out to be delivered, and is therefore more expensive than upstream sources. In addition, water prices south of the Delta reflect an economy that depends in a substantial part on water supplies imported into the region. These imported water supplies are more expensive than locally developed water supplies.

Initial EWA water purchases during 2001, the first year of operation, followed the general split of sources established in the CALFED ROD, although upstream-of-Delta purchases of 105 TAF exceeded the 35 TAF specified in the CALFED ROD to help produce the targeted quantity for return to the projects at O'Neill Forebay. In 2002 water purchases from upstream of Delta sources were also increased beyond that established in the CALFED ROD, reducing the amount of south of the Delta purchases and providing the "functional equivalent" of the 150 TAF of EWA assets south of the Delta to repay Delta export reductions.

In 2003, the EWA structured its purchases to allow accommodation of most possible hydrologic outcomes through options. The water year was relatively dry until spring, when substantial rainfall increased SWP allocations and reduced cross-Delta transfer capacity for the EWA to only its dedicated 500 cfs. The EWA agencies were able to finalize purchases in May after the cross-Delta capacity was defined for the year, maximizing that limited capacity and acquiring the balance of the water in the export service area.

In 2004, the EWA also structured agreements to allow accommodation of most possible hydrologic outcomes through options. The water year was about average until February, when it became relatively dry. There were fewer fish actions taken in response to ongoing monitoring, and the costs to the EWA were a record low 124 TAF for the 2004 operational year. The EWA agencies purchased 35 TAF south of the Delta and 120 TAF upstream of the Delta, seeking to use the extra cross-Delta capacity resulting from the dry spring. Options for additional water both upstream of the Delta and south of the Delta were not exercised. The purchases were tailored closely to the need; however, operational issues, including pond weed problems in Clifton Court Forebay and water level problems in the Delta, and transfer timing relative to the removal of in-Delta barriers, later prevented the EWA from pumping all of its upstream purchases in the Delta. Some of the water that was not captured in the Delta did provide late-season in-stream flow benefits for Chinook salmon in the American River.

The EWA has become more efficient and has minimized its costs by expanding the concept of functional equivalency referenced in the CALFED ROD. The concept has been effectively applied to a water purchase strategy that maximizes water purchases upstream of the Delta consistent with the Project's capability to convey EWA water across the Delta. Water supplies need to be acquired and moved across the Delta in the summer transfer season, July through September, preferably prior to the low point in San Luis Reservoir, which typically occurs in August or September, to avoid the need for source shifting.

From a financial point of view EWA purchases are focused on upstream of Delta areas to minimize costs. However, the EWA does not have secure pumping capacity available to convey all of the water it needs to purchase across the Delta in all hydrologic conditions. Therefore, the EWA pursues a strategy where it maximizes upstream of Delta purchases to the extent that it can convey water across the Delta and obtains the balance from sources in the export service area.

Table 2 shows the cross-Delta conveyance capacity that the EWA Team used to develop its water purchase and management strategy for 2005. The available capacity estimates include conveying 60 TAF using the 500 cfs summer capacity dedicated to the EWA. The EWA priority for pumping is set forth in the CALFED ROD and detailed in the 2005 Protocols for the Operation of the EWA. An unknown factor is the extent that other SWP contractor water transfers will reduce the EWA's access to SWP conveyance. An assumption has been made regarding the likely volume of SWP contractor transfers with a priority higher than the EWA at various SWP allocations based on recent experience.

In addition to the July-September capacity, the potential exists to transfer additional water through the Delta after September 30 in addition to the assumed limits shown in Table 2. Transfers from the American River and Merced River can be moved later in the season to provide additional in-stream fish benefits, and can then be pumped, depending on Delta conditions. The EWA Agencies are contemplating some acquisitions on the American and Merced rivers in 2005.

If the amount of water being transferred for SWP contractors from upstream of the Delta increases, then the SWP's capacity to convey EWA water beyond its 500 cfs July-September permit will decrease. In addition, the conveyance of the SVWMA settlement water supplies for SWP contractors will also decrease the ability of the EWA to use capacity beyond its reserved 500 cfs. SVWMA transfers are expected to begin in 2006 or later, and will not affect 2005 operations of the EWA.

Table 2 shows that the EWA's capability to convey water through the SWP facilities decreases in normal and wet years, and is lowest when SWP allocations are about 90% of requests and above. A marked transition occurs in dry to below normal years (SWP allocations between 35% and 85%). The EWA agencies will purchase water upstream of the Delta consistent with this table up to the amount deemed necessary, allowing for anticipated carriage water losses.

Because SWP allocations are unknown when contracts are being negotiated, EWA contracts will use options for part of the purchases upstream of the Delta or contract provisions tied to SWP allocations to accommodate uncertainty over conveyance capacity. Water purchases south of the Delta can be tied directly to SWP allocations in many instances.

Table 2
Anticipated EWA Cross Delta Conveyance as a Function of SWP Allocations in 2005

SWP Annual Allocation Percentage	EWA Cross-Delta Capacity, July-Sept. TAF (1)
100	60
95	60
90	60
85	84
80	118
75	144
70	169
65	195
60	220
55	247
50	274
45	302
40	329
35	354
30	378
25	396
20	414

(1) Capacity computations assume that EWA has only 500 cfs capacity (about 60 TAF) from July-September in wetter years. Additional capacity becomes available in drier years, limited by a modest Dry Year Water Acquisition Program, some pumping for the CVP, and assumed SWP contractor transfers at the lower SWP allocations.

C. Coordination of EWA with CVPIA Section 3406 (b)(2) Assets

CVPIA Section 3406 (b)(2) provides that 800 TAF of CVP yield be dedicated to fishery benefits. The DOI has been managing the (b)(2) program for several years, and the EWA Agencies have been coordinating its operation with the EWA. However, recent court decisions have found that the accounting mechanisms used to calculate (b)(2) expenditures needed modification. The court ordered that new accounting methods be employed.

DOI has implemented a new (b)(2) policy that reflects the findings of the court and that provides less flexibility for the use of (b)(2) water and fewer Delta fish actions. The management of EWA assets will continue to be coordinated with the management of (b)(2) actions as those actions will affect EWA water purchase needs and use of EWA

funds. The EWA operational gaming that has been conducted for the EWA assumes that the two programs would be coordinated.

A proposal has also been made that the EWA provide water for fall actions under (b)(2) when the annual allocation of (b)(2) assets has been fully expended on certain other actions. This proposal is being evaluated by Reclamation with the goal of defining how the proposal might work and its possible costs or benefits to the EWA, if any.

In 2001, 2002, and 2004 EWA assets were used to provide fish benefits in limited ways upstream of the Delta. Actions have included bypassing the power plant with a portion of Folsom Reservoir releases in the late fall to draw upon the cold water pool deep in the reservoir. The cold-water releases helped achieve improved temperature conditions for salmon spawning and outmigrating steelhead in the Lower American River. This action used EWA power credits; no EWA water was used. (This action was not needed in 2003 or 2004 because of a larger cold-water pool in Folsom Reservoir and the timing of the river's seasonal cooling.)

On the Yuba River in all four years, releases of EWA assets were scheduled partly to support instream fishery benefits during the EWA water transfer. Instream habitat benefits were provided by fall releases on the Merced River in 2001. Instream habitat benefits were also achieved with EWA assets acquired on the American River in 2001, 2002, and 2004 through late-season flow augmentation.

The EWA budget is currently reserving about $0.84 million for federal power purposes. Some of this money may be used to purchase power lost by the Folsom bypass next fall. Some may be used to pay the differential power costs associated with pumping EWA water in the summer to replace Delta exports forgone earlier during curtailments to protect fish, when unit power costs are greater than when the power was being saved during the curtailments.

D. Continued Coordination of EWA Water Acquisitions with DWR's Dry Year Program, Reclamation's CVPIA Level 4 Refuge and Instream Flow Purchases, and Other CALFED Water Purchase Programs

One of the major challenges of the EWA is to coordinate its water purchase actions with those of other CALFED programs. In 2002 and 2003, DWR coordinated water purchases for the State's Dry Year Program with the EWA purchases. In extremely dry years, EWA water needs will decrease while the needs of water users will likely increase. These somewhat offsetting demands and the general benefit that the EWA provides to all the contractors of both the SWP and CVP argue for this continued coordination. Where there is conflict in demand for purchased supplies between the Dry Year program and EWA, the balancing of the programs' needs should consider EWA's role in providing the ESA commitments that protect the CVP and SWP water

supplies. However, conveyance of dry year water for SWP contractors takes priority over EWA conveyance under the established protocols.

The CVPIA Water Acquisition Program purchases water for instream uses and for the Vernalis Adaptive Management Program (VAMP) through the San Joaquin River Agreement, a twelve-year program. The CVPIA Water Acquisition Program also purchases water for Level 4 wildlife refuge supplies. The SJRA needs do not compete with or conflict with the EWA. Also, most refuge supplies have been purchased south of the Delta and do not directly conflict with the EWA's need for export capacity. There may be opportunities for mutual benefits among these programs.

As discussed below, federal partners south of the Delta are beneficial to the EWA. CVP contractors south of the Delta who have in the past partnered only with the refuge program have expressed some interest in selling water to the EWA. Due to the offset in timing of needs and variable funding for the CVPIA refuge program, both programs could benefit from joint purchase contracts. The EWA would benefit by having additional markets south of the Delta to purchase water. The coordinated use of water between these two programs would be resolved during the contract process in a manner acceptable to both programs.

Other water purchase programs by CALFED agencies include the Environmental Water Program (EWP) as being implemented under CALFED's Ecosystem Restoration Program (ERP), CVP's coordination of dry year purchases by its contractors, the Drought Risk Reduction Investment Program (DRIPP) currently under development by DWR, and the purchase of water made available by the Sacramento Valley Water Management Program (SVWMP, which is the local program providing water under the SVWMA water right settlement process). The EWP program is charged with purchasing up to 100 TAF of water per year to improve salmon spawning and juvenile survival in tributary streams upstream of the Delta by the end of CALFED Stage 1. Some of the EWP purchased water may contribute to EWA if the water can be pumped from the Delta. The EWP does not currently target streams that would conflict with EWA purchases. However, as the EWP program develops there may be opportunities for joint EWP/EWA purchases where water is purchased specifically for upstream actions that will also augment Delta supplies at a time valuable to the EWA.

The DRIPP would only initiate water purchases in the event a drought occurs and buyers request supplemental supplies. Purchases will be made to satisfy those orders for water only. These purchases are likely to be initiated long after the EWA has identified its supply sources and negotiated purchase contracts. The coordination of this developing program with the EWA has not yet been addressed, and coordination will depend on how and when the water purchase aspects of the program are implemented.

The coordination of the SVWMP water purchases may take the form of joint contracts where part of the water will be made available for SWP and CVP contractors and if extra water supplies exist, water could be made available for the EWA and DWR's Dry

Year Program. The price provisions of the SVWMP water have already been negotiated and will likely be different from the market rates at which the EWA and the Dry Year Program will be able to purchase water.

E. EWA Acquisition Strategy: The Need to Set Water Purchase Targets

The CALFED ROD establishes annual EWA water purchase targets of at least 185 TAF. The EWA Team has interpreted the concept of functional equivalent as the ability to deliver an equal quantity of water south of the Delta to that which was used to protect fish at the time of an operational curtailment. Under this interpretation, EWA purchases of water upstream of the Delta need to include allowance for additional water to offset the carriage water and other system losses that are experienced moving this water to the pumping facilities in the Southern Delta. Fall conveyance losses in the San Joaquin River and its tributaries have been estimated at 10%, while carriage water losses in the Sacramento River and its tributaries are estimated at 20% for planning purposes. Actual Delta carriage losses were 15% in 2001, 20% in 2002, and 0% in 2003 and 2004.

The EWA proposes to use this functional equivalent concept as a key aspect of its strategy to maximize upstream of Delta purchases consistent with cross-Delta conveyance capacity.

Based on the use of this EWA purchase strategy, the EWA's expected budget, the prices for water and services that may be possible for the EWA in 2005, and past modeling and gaming, the recommended EWA delivery targets for purchased (fixed) assets would increase from 185 TAF to 210 TAF in critical years, 220 TAF in dry years, and 220-230 TAF in below normal and wetter years. The purchase targets are higher than the 185 TAF established in the CALFED ROD to help support targeted fish actions in 2005 and to ensure that the EWA can provide the assets required to meet operational needs considering operational (variable) assets, carriage losses, and other variables. This increase of EWA purchased (fixed) assets should help to ensure that the CALFED ROD commitments are achieved and continue the trajectory toward recovery for fish species of the Bay/Delta estuary.

F. EWA Acquisition Strategy: Purchase Partners

The EWA needs to broaden its base of potential partners from which to purchase water. For the EWA to be an effective partner, it needs to understand the needs of the sellers, develop a clear understanding of the types of water it wishes to purchase, and communicate the conditions that will apply to transfers that require the use of project facilities to complete.

The EWA Agencies and their purchase partners will need to structure purchases and manage resulting assets consistent with the requirements of the EWA EIS/EIR ROD/NOD adopted in March 2004. The EWA Agencies have agreed to implement a number of environmental, conservation and mitigation measures to protect resources, depending on the type of assets being acquired and their locations. These measures are included in the EWA EIS/EIR ROD/NOD and will either be implemented by the EWA Agencies themselves, or by the selling water agency as a contract condition. In addition, the EWA Agencies will work with prospective sellers on issues related to compliance with CEQA, NEPA, and the state and federal endangered species acts.

For example, the agencies will coordinate with recreation agencies to minimize recreation impacts from purchasing stored reservoir water; require selling districts to implement certain conservation measures to protect the giant garter snake if rice crop idling is pursued upstream of the Delta; require a cover crop or other air quality mitigation measures if cotton crop idling is implemented in the export service area; and require management of air emissions from diesel engines on groundwater pumps if groundwater substitution is pursued.

In 2002, the DWR developed a set of water transfer papers that explain current water transfer laws and the DWR's compliance with these laws related to the purchase of water for the EWA and other programs. These papers provide water sellers a set of tools they can use to develop mitigation measures that protect other legal users of water and fish and wildlife as they develop their water transfer proposals. These papers can be found at: http//www.watertransfers.water.ca.gov.

Mitigation measures similar to those provided in the water transfer papers are included in the Final EWA EIS/EIR where appropriate to protect resources, and will be implemented by the EWA Agencies or through contract requirements.

G. EWA Water Purchases Upstream of the Delta

As discussed above, water purchases upstream of the Delta are typically less expensive to the EWA than those south of the Delta. The EWA should maximize its purchases upstream of the Delta to the extent it needs the water and can effectively move this water through the Delta. The EWA could base these contracts on SWP capacity to convey this water for the EWA under its pumping priority. However, upstream of Delta sellers may be reluctant to base purchases on these allocations. If this proves to be the case the EWA could set up options to purchase water, as it has in the last two years. A small non-refundable option payment would be made and dates set for the call of the option. Once called, the water would be delivered and the strike price (remainder of payment) made to the seller.

Upstream-of-Delta purchase targets are determined by using the cross-Delta transfer capacity values previously shown in Table 2, allowing for 20% carriage losses. For SWP allocations of 85-100%, for example, the EWA would purchase 75 TAF and

transfer 60 TAF, with 15 TAF comprising the carriage losses. The EWA would plan to purchase 75 TAF in all year types. If SWP allocations remain below about 70%, upstream-of-Delta options would be exercised to increase upstream-of-Delta purchases up to the expected cross-Delta transfer capacity or the annual purchase target, whichever governs, allowing for the carriage losses.

Aggressive use of options upstream of the Delta would provide the EWA flexibility to deal with changing hydrologic conditions. One concern related to options is that in many cases the call dates requested by the sellers occur early in the year before much is known about the hydrologic conditions. The EWA will seek option call dates as late into the year as possible consistent with the needs of the sellers.

The EWA would take a small risk of stranding water upstream of the Delta if, after exercising its options, there are late storms and hydrology improves, and the EWA loses some of its projected transfer capacity. This situation could leave assets stranded upstream and subject to loss. The risk can be minimized with options that can be exercised late in the spring after the chance of significant additional rainfall is minimal. Also the EWA will likely not call on all the options if the year turns wet. Thus in some years the small option fee will be paid on water that will not be delivered from some contracts. These options are similar to insurance costs, and are part of the expense of obtaining lower cost water overall.

1. Transfer Types Upstream of the Delta

There are three basic ways in which water can be made available for transfer: from previously stored flows, through use of alternative supplies that would not otherwise be used, and from reductions in use. In any case, it must be demonstrated that the water is being made available from a legitimate source and that there is no unreasonable harm to fish and wildlife.

Certain types of water transfers are easier to implement and manage than others, and are preferable to the EWA. Experience has shown that transfers of previously stored flows are the most flexible. If a willing seller owns a storage reservoir, they often have the flexibility to manage their facilities to make water available from supplies excess to their needs. To complete the transfer, they must demonstrate how they intend to make the water available, agree to a release pattern that at a minimum causes no harm to fish and wildlife resources, and enter into a refill agreement to prevent harm to other legal users of water.

Where applicable, option call dates are often set for late spring, which provides the seller a better idea of the amount of water available to transfer. Reservoir storage transfers work to the EWA's advantage because the later call dates allow the scheduling of the releases with greater certainty that the EWA will have access to transport capacity in the Delta.

Groundwater substitution transfers are the next type of transfer used by the EWA. Such transfers involve the substitution by the seller of groundwater supplies for its usual surface water diversions to meet local needs, making the surface water supply available for transfer. The greatest flexibility is offered when willing sellers can have their surface water supply held in an upstream reservoir for later release to the EWA. When this is not possible, the groundwater substitution pattern must coincide with the availability of EWA export capacity in the Delta. Groundwater substitution transfers require a demonstration that the wells being used are not pumping surface water and will not adversely affect wetlands. If the transfer requires the use of Project facilities, monitoring and mitigation programs must be in place as identified in the EWA EIS/EIR ROD/NOD. Air quality impacts must also be addressed if the pumping involves diesel pumps in a non-attainment area.

The third and least flexible type of transfer involves the idling of cropland to make water available for transfer. Crop idling transfers have been implemented historically in the Sacramento Valley in extremely dry years. The volume of water available for transfer is limited to that quantity that would have otherwise been consumed or lost to a saline sink. In locations where water deliveries are made directly from a reservoir to the water users (such as the Feather River Settlement contractors or Sacramento River settlement contractors) water not used for irrigation can be held in storage (e.g., Oroville Reservoir or Shasta Reservoir) and released for the EWA at a time when it can moved through the Delta and exported when capacity for water transfers is available, or when impacts on fish in the Delta are least likely to occur.

However, in cases where the willing seller has direct diversion rights from a river, forgone diversions for consumptive use in April, May, and parts of June may not be effectively captured and exported by the Projects for the EWA. For this water to be captured, the Projects must have the capacity to convey water for the EWA when it is made available, or the Projects must have the ability to back these supplies into a CVP or SWP upstream storage reservoir. The increased flow due to the decrease in river depletions may not be able to be captured by the Projects for the EWA in the Delta if there are ongoing export restrictions to protect fish at the Delta pumping plants or if the Delta is out of balance (excess conditions) during these months.

Backing the water into upstream reservoirs is rarely possible because of operational constraints or flow, temperature, or other regulatory requirements downstream from the reservoirs. Therefore, only the water supply that can be captured effectively by the Projects during part of June, July, and August accrues to the EWA, even though irrigators have not planted crops and ceased diverting water to irrigate idled acres earlier in the year. Because the EWA would likely not capture the full amount of water potentially made available, the unit costs for water actually obtained could make this water more expensive and less desirable for the EWA to purchase than water from other types of transactions. In addition,

the decision to exercise options for crop idling transfers must be made very early in the year (around February) to provide farmers enough time to plant crops if the option is not called. Crop idling transfers upstream of the Delta will likely only be used in extremely dry years for those areas not served directly from reservoirs.

2. Upstream of Delta Transfer Sources

Potential EWA partners for upstream of the Delta transfers include:

Yuba-Feather River

- Yuba County Water Agency (YCWA): Reservoir storage
- Member agencies of YCWA: Groundwater substitution with re-regulation by YCWA
- Browns Valley Irrigation District: Reservoir storage from Collins Lake and groundwater substitution with re-regulation by YCWA
- South Feather Water and Power Agency (formerly Oroville-Wyandotte Irrigation District): Reservoir storage
- Feather River Settlement Contractors (Western Canal Water District, Joint Water District Board, Garden Highway Water District, others): Crop substitution, crop idling

Sacramento River

- Sacramento River CVP contractors and Settlement Contractors (Glenn-Colusa Irrigation District, Orland-Artois Water District, Reclamation District No. 108, Tehama-Colusa Canal users, others): Groundwater substitution, crop substitution, crop idling
- Orland Unit Water Users Association: Reservoir storage

American River

- Placer County Water Agency: Reservoir releases, crop idling
- Sacramento Groundwater Authority: Sale of banked groundwater by exchange, groundwater banking services

San Joaquin River

- Merced Irrigation District: Groundwater substitution with reservoir re-regulation, crop idling
- Other east side San Joaquin Reservoirs (specifics to be provided by EWA Team)

H. EWA Water Purchases South of the Delta

The amount of water needed from areas south of the Delta increases in normal and wet years and is less in dry years when there is capacity available to move water from areas upstream of the Delta. The amount of water needed south of the Delta can usually be determined by subtracting the upstream-of-Delta deliveries from the delivery target. The remainder is the south-of-Delta purchases. Table 1 provides a general illustration of this calculation for the proposed 2005 water purchases. Table 3 provides greater detail of the estimate of south-of-Delta purchases for 2005, based on cross-Delta transfer capacity estimated to be available to the EWA.

In addition, the EWA Agencies are purchasing some water south of the Delta for budgetary reasons regardless of cross-Delta capacity. Funding committed under Proposition 204 in 2003 was not fully used, and is available for EWA purchases from two willing sellers in the south-of-Delta region through modification of 2003 agreements. The quantities in Table 3 include these added purchases.

The capacity estimates used to develop Tables 2 and 3 assume a minimal DWR Dry Year Water Purchase Program, although that program would be activated for transfers up to 200 TAF if allocations were below 50%. Cross-Delta transfers by SWP contractors using their higher conveyance priority are assumed to be inactive in the wetter conditions, but are assumed to range up to 200 TAF if allocations were below 50%.

Table 3
Estimated South-of-Delta Water Purchases for 2005

SWP Allocation	Approximate Quantity, TAF
50%	30
55%	30
60%	30
65%	75
70%	140
75%	150

80%	150
85%	155
90-100%	160

South-of-Delta purchases in the SWP service area can be tied directly to SWP allocations as was done in 2002-2004 in the Kern County Water Agency contracts. This provision has an advantage because the price of the water often decreases with the increase in the SWP allocation. Therefore, as the need for water for the EWA increases the price per acre-foot decreases. Contracts can be written to reflect this dynamic if the quantity and price are both tied to SWP allocations. If the contractor is a CVP contractor the same types of contracts might be possible.

South-of-Delta purchases will be sought from willing sellers in both the SWP and CVP service areas. It is administratively easier and often locally preferable to repay operational curtailments (reductions in exports) with water that was purchased from the respective service areas of the two projects. In dry years it is not as critical to have assets from both sources; in normal and wet years, when most purchases are forced to be south of the Delta, a realistic split of purchases in these two service areas is desirable.

The EWA will exercise operational curtailments at both the CVP and SWP export facilities in the Delta. In 2002 the split of export reductions between the CVP and SWP was about 25% CVP and 75% SWP. In 2003 the split of operational curtailments between the CVP and SWP was about 8% CVP and 92% SWP. In 2004, the split of reductions was about 53% CVP and 47% SWP. (Operational curtailments at Banks Pumping Plant are easier to implement and often provide greater biological benefits than curtailments at Tracy.) A preliminary ratio of 70% SWP and 30% CVP will be used as a guide in developing contracts for south of the Delta between water users in these two service areas in 2005.

1. Transfer Types South of the Delta

To date the EWA has primarily pursued the purchase of previously banked groundwater south of the Delta for the EWA from south of Delta sources. In 2003, a 20 TAF transfer from Santa Clara Valley Water District to the EWA included CVP contract supply. It is probable that the EWA will pursue additional transfers of this type as well as cotton crop idling transfers in this region.

Due to contract language in the SWP Long Term Water Supply Contracts, only previously banked groundwater or water that would otherwise be banked can be sold to others. This restriction limits the EWA's capability to purchase water south of the Delta. As explained above, purchases of south of Delta banked groundwater are more expensive than upstream of Delta purchases. In addition,

there is a limited quantity of banked groundwater that can be purchased, and this supply could be exhausted in the next few years.

DWR staff is working with its contractors to determine ways this limitation might be resolved in the future. There is no comparable constraint to CVP transfers, and the EWA Agencies are likely to pursue more transfers of CVP water based on cotton crop idling and other transfer premises in 2005.

To the extent that the EWA purchases previously banked groundwater south of the Delta, negotiating a provision that allows the EWA to maintain this water in the bank for another year or more if it is not needed as initially anticipated would provide needed flexibility. Prior experience indicates that negotiating these terms can be complicated and introduces an associated cost. However, this cost needs to be balanced against the potential consequences of extracting the water and then needing to protect it from loss if it is not needed for a fish action before San Luis Reservoir fills and the water is displaced. Three-way exchanges, such as implemented in 2003 between the Metropolitan Water District of Southern California (MWDSC), Kern County Water Agency (KCWA), and the EWA can allow the water to be protected at minimal or no cost to the EWA.

2. South of Delta Transfer Sources

Potential partners in areas south of the Delta include:

East Bay Region

- Santa Clara Valley Water District (SCVWD): Local storage to provide flexibility for EWA: exchanges; source-shifting (deferred delivery); groundwater banking services (Semitropic Water Service District banking program); sale of CVP contract supply in wet periods

San Joaquin Valley

- SWP contractors including KCWA and its member agencies and regional banking agencies (Semitropic Water Service District, Cawelo Water District, Tulare Irrigation District, Rosedale-Rio Bravo, Westside Mutual Water Company, Tejon-Castac, and others): Sale of banked groundwater, by exchange or direct pump-in to aqueduct; groundwater banking services; surface water destined for recharge, by exchange; crop substitution, crop idling, wet/dry exchanges

- CVP contractors including users in the San Luis Unit, San Joaquin River exchange contractors and Cross Valley contractors: crop substitution, crop idling, wet/dry exchanges

- Other San Joaquin Valley agencies: groundwater banking services; surface water destined for recharge, by exchange; crop substitution, crop idling, wet/dry exchanges

- Other agencies outside of the San Joaquin Valley that bank in the San Joaquin Valley, including SCVWD, MWDSC: groundwater banking services as a subcontractor

Southern California

- MWDSC: Sale of banked groundwater, by exchange or direct pumping into the California Aqueduct; groundwater banking services; wet/dry exchanges; source shifting

I. Operational (Variable) Assets and Tools Needed

The CALFED ROD indicates an average of the purchased (fixed) and operational (variable) assets for the EWA could be 380 TAF. This average includes 185 TAF in purchased assets, 70 TAF from relaxation of the E/I ratio and (b)(2) releases that reach the Delta, 500 cfs of dedicated capacity at Banks pumping plant (estimated at 50 TAF), and use of one-half of the excess capacity at Banks (estimated at 75 TAF).

The 380 TAF number contained in the CALFED ROD is potentially misleading because it includes both capacity and real water assets. These two categories cannot be added to provide a meaningful estimate of the average water budget. A more accurate reflection of the average quantity of water available would be to add only those assets that provide water. Table 4 shows the operational (variable) assets as defined in the CALFED ROD, highlights those that actually provide water, and quantifies the amount of water that has been obtained in 2001-2004.

The combination of purchased and operational (variable) assets was intended, on average, to provide sufficient assets to meet fish protection needs without reducing deliveries to the contractors. Under certain hydrological conditions, such as the two dry years of 2001 and 2002, as well as 2004, some of the operational (variable) assets would not produce any water. In addition, operational (variable) tools, such as relaxation of the Export/Inflow (E/I) Ratio, produce water in relation to the management of this particular asset.

Based on this analysis of operational assets and the management of the operational tools during the last three years, the EWA can reliably expect to get limited utility from

those assets in years with hydrologic conditions similar to 2001-2004. More assets would be possible from the Joint Point of Diversion in wetter years if the EWA (1) carried debt into the winter in San Luis Reservoir, or (2) had a reliable location south of the Delta where water could be temporarily stored and economically retrieved or exchanged in the same or subsequent years. More assets may be obtained if conditions are appropriate for the Management Agencies to relax the E/I Ratio more often, similar to what occurred in 2000, 2001, 2002 and 2003.

In the near future, acquisition of rights to additional short-term surface or groundwater storage south of the Delta should be considered by the EWA to achieve this storage capability and protect assets from loss in wet periods. Groundwater storage costs are estimated at about $160 to place and retrieve water in addition to any costs of acquiring the water to be placed in storage and current offers do not allow the EWA to retrieve this stored water in years drier than 60% SWP allocation years.

Table 4
Operational (Variable) Assets in the CALFED ROD Compared to Actual EWA Benefits in 2001-2004

Operational (Variable) Asset	CALFED ROD Average in TAF	2001 Actual in TAF	2002 Actual in TAF	2003 Actual in TAF	2004 Actual in TAF
Variation of E/I ratio	40	2	79	67	0.2
Half of (b)(2) releases that reach the Delta	30	46	3	19	0.4
500 CFS dedicated capacity at SWP Banks PP	50 [1]	0 (Capacity only)	0 (Capacity only)	0 (Capacity only)	0 (Capacity only)
Joint Point Of Diversion (use of excess capacity at SWP Banks PP)	75 [2]	0 (Capacity; may yield water when Delta in excess)	0 (Capacity; may yield water when Delta in excess)	0 (Capacity; may yield water when Delta in excess)	0 (Capacity; may yield water when Delta in excess)
ROD Total	195				
Actual Water: Expected Average, and Actual Totals	70	48	82 (20 was retained past San Luis High Point)	86	~0

Another method to preserve a portion of EWA assets is an exchange as was done in 2002. In this case a 2 for 1 exchange was made where 2 units of EWA water were provided to SWP contractors prior to high point in San Luis and these users returned 1 unit of water to the EWA after high point. There was no out-of-pocket dollar cost to the EWA for this action, yet it provided "temporary storage" for 20,000 acre-feet, half the assets in San Luis at the time.

[1] Capacity - Represents a quantity expected to be moved using EWA's permitted 500 cfs of dedicated capacity at Banks above 6,680 cfs from July through September. The COE permit for the 500 cfs capacity was valid through September 2004, and an application has been filed for its extension through 2008.

[2] Capacity - Represents one half of the available excess capacity at the SWP Banks pumping plant. Under balanced conditions, this asset is only capacity and the EWA must supply water it has purchased or stored upstream to take advantage of this EWA asset. During excess conditions in the Delta, the EWA may be able to use this capacity to obtain Delta water provided that EWA has an existing debt in San Luis or EWA has a location other than San Luis to store this water and Article 21 demands are being met.

In 2003, a three-way exchange occurred between the EWA, KCWA, and MWDSC that allowed EWA to protect banked groundwater assets purchased from KCWA that would have either been extracted and subsequently spilled, or incurred a carryover fee. MWDSC borrowed the EWA water that KCWA had previously stored in the Kern Water Bank; KCWA pumped that water into the California Aqueduct for MWDSC's use; and MWDSC returned the water to the EWA after high point the following spring. EWA protected this stored water asset and avoided payment of the carryover fee, KCWA saved on the power costs, and MWDSC received an improvement in water quality in the California Aqueduct.

The EWA Agencies negotiated the terms of an exchange with MWDSC for 2004 that involved EWA providing water to MWDSC, MWDSC paying half the cost and agreeing to provide EWA an equivalent amount of water in a future year with SWP allocations at 80% or higher. The exchange agreement was not finalized, however, and the exchange was not implemented because of wetter hydrologic conditions.

The Management Agencies were previously requesting "place holders" for about 150-300 TAF of fish actions before high point in San Luis Reservoir in most years. If these actions are taken and San Luis Reservoir fills and additional pumping capacity beyond SWP Article 21 demand is available, EWA debt would be extinguished in San Luis Reservoir to the extent of the additional pumping. In such an event, the EWA could gain additional assets at the rather modest cost of pumping the water from the Delta.

However, if San Luis Reservoir does not fill or there is no extra pumping capacity to extinguish the debt, as is most likely in the drier years, then the debt would not be extinguished and the EWA would not have gained any assets. However, experience over 2001 and 2002 indicates that large placeholders may not be needed in dry years due to lower export rates in those years. For planning purposes, the estimation of operational (variable) assets needs to be keyed to the filling of San Luis Reservoir and the availability of pumping beyond the demand for Article 21 water by the SWP contractors in the wetter years. At present, it is unknown how much EWA can accrue under current Banks operations, although recent CALSIM II modeling results imply that some debt erasure should be possible in one-third to one-half of years. This conclusion depends on the accuracy of the assumption about SWP contractors' demand for water under Article 21.

Thus for the purposes of evaluating the EWA's ability to provide the assets that will be required to satisfy the assumed placeholders for fish actions, it is assumed that some benefits would accrue to the EWA from the extinguishment of debt in San Luis Reservoir in wetter years. In drier years, pumping is less, and therefore EWA placeholders are reduced, the need for large operational (variable) assets is less, and the ability to extinguish EWA water debt in San Luis Reservoir is also less (see section V).

J. The EWA Source Shift

Source shift arrangements are EWA assets that are required by the CALFED ROD. Source shifting is a way for the EWA to temporarily borrow water from a water user that draws on an alternative (often local) source of water and temporarily reduces its SWP or CVP deliveries, allowing that water to remain in San Luis Reservoir. Source shifting is initiated in the spring and summer before San Luis Reservoir reaches its seasonal low point, and completed by paying back the water after low point-related concerns have abated.

The source shift is a valuable tool for the EWA in some years. The source shift allows the EWA to avoid causing or aggravating water quality or water supply problems around the low point in San Luis Reservoir storage that might otherwise occur because the EWA owed water to the projects at that time.

The source shift allows the EWA to shift demand around low point issues and to carry debt to the source-shifting contractor(s) into the fall and winter. By avoiding the need to pay back all previous operational curtailments prior to low point, source shifting allows the return of up to 100 TAF of water to the SWP and CVP after August, allowing more efficient use of export capacity. The source shift can be viewed as a “bridge loan” of water because it must be paid back within a specified period of time.

One issue with the source shift is that it remains relatively expensive, although it now costs less than purchasing water upstream of the Delta. In 2001, it cost as much to “rent” source shift water for four months as it did to purchase an equivalent volume upstream of the Delta, although it had a separate purpose and provided a different value to the EWA. The 2003 and 2004 agreements incorporate a significantly reduced cost structure from the 2001 and 2002 agreements. Recent discussions with contractors indicate the costs may be decreased further in 2007 and later years.

The EWA Agencies will obtain the required contract each year and pay the option fee, if any, but would activate the source shift only when forecasts of the EWA’s impact on San Luis Reservoir storage indicate storage levels of concern, or when the use of water for fishery actions has been unusually high and the EWA needs to carry debt into the following winter. The EWA agencies did not activate the source shift in 2002, 2003, or 2004 because EWA operations did not adversely impact San Luis Reservoir low-point operations.

If in the future, the project agencies practice more aggressive drawdown of San Luis Reservoir, the likelihood will increase that EWA debt will cause storage to reach problem levels and increase the frequency that the EWA must exercise source-shifting agreements. A permanent solution of the low point-related water quality problems for some users could reduce or eliminate the need for source shifting in the future.

K. Borrowing and Long-Term Storage

The EWA may borrow water from the SWP or CVP to achieve fishery protections, provided that such borrowing will not result in any reduction in CVP or SWP deliveries. Borrowing is allowed if it will not cause a reduction in deliveries in the year of borrowing or in the subsequent water year. The EWA Operating Principles Agreement anticipates that an EWA asset will be in place as collateral to allow the borrowing of water both within and between years. The CALFED ROD specifies that a one-time asset of 200 TAF of stored water or its functional equivalent be provided from south-of Delta sources.

During the EWA "gaming," as much as 100 TAF of this collateral was used to pay back borrowing because there were not sufficient assets in the following year to pay back the EWA debt. Also, the water projects are allowed to borrow water from the EWA when it is agreeable to all parties. In both cases the same principles apply: A proposal is made that includes: (1) the quantity of water to be borrowed, (2) the term of the loan, and (3) specific criteria for repaying the water to the lender.

As stated above, the EWA Operating Principles Agreement provided that 200 TAF of stored water (or its functional equivalent) would be provided for the EWA. During the first year of EWA operation, insufficient funds were available to acquire both the 200 TAF of storage space and water. A decision was made in 2001 for the EWA to purchase more than 100 TAF of water above the 185 TAF target in the CALFED ROD. The additional water served as the functional equivalent of the 200 TAF of storage that year.

This use of functional equivalency in the first year of the EWA allowed the program to provide sufficient assets to obtain ESA commitments in the absence of long-term environmental documentation covering the acquisition and operation of stored assets, and to remain within the budget constraints of the EWA. In 2002, the EWA purchased approximately 242 TAF of water, and in 2003 purchased 215 TAF. Purchases in 2004 totaled 155 TAF.

In each year beginning in 2002, the Project Agencies agreed to allow the EWA to borrow water, thereby providing the functional equivalent of the EWA storage asset required by the CALFED ROD, subject to its prudent repayment under the following conditions. These conditions were established in the EWA protocols for 2002-2005, and are expected to continue in subsequent years. These protocols (updated for 2005) provide that in any given year, up to 100 TAF may be borrowed against the subsequent year EWA assets provided the following conditions are satisfied:

1. The borrowed assets are paid back to the Projects. This occurs when:
   (1) operational (variable) assets are used to pay back the debt as they accrue during the next year, or
   (2) hydrology is sufficient to allow San Luis Reservoir to be filled to the level it would have been absent EWA actions that required borrowing.

2. The borrowed assets may be carried over into 2006 if:
   (1) the Project Agencies determine that such an action would not impact CVP/SWP allocations in 2005 or 2006, and;
   (2) the EWA can provide sufficient source shifting to avoid impacting storage in San Luis Reservoir at its low point in 2005.

3. Sufficient funding must be provided to acquire the necessary purchased assets for 2006 (185 TAF) plus additional water to repay the amount borrowed. If funding is insufficient to acquire the necessary assets and repay debt, and it is not possible to carryover the debt to 2006, the Project Agencies and Management Agencies will meet to consider alternative repayment options. The objective for both the Project and Management Agencies is to ensure continued EWA operations.

This arrangement of functional equivalence for the 200 TAF of storage will be sought for 2005.

V. EWA Fish Actions: Placeholders for EWA Expenditures

Along with the targets for EWA purchased assets, a set of placeholders is necessary for expected expenditure of EWA assets on a monthly basis during the year. The schedule of expected expenditures allows the fishery agencies to assess their water spending during the year and to make decisions to conserve water for later periods based on expected needs.

In March 2005, the Management Agencies developed placeholders for fish actions based on current hydrology and operational forecasts. Current placeholders are 300 TAF, including two prior pumping curtailments in December 2004 and February 2005. Purchases plus prior debt erasure would meet this fish protection target, with the possibility that there would be some EWA debt at year-end.

This water acquisition strategy incorporates assumed placeholders for water expenditures based on the recommended increase in asset purchases, the recognition that operational (variable) assets do not in all cases provide water, and the use of the source shift and borrowing from the projects to carry debt from one year to the next. The placeholders are assumed to reflect coordination with available (b)(2) assets. The annual total placeholders for EWA in 2005 based on these assumptions are shown in Table 5. In addition to the placeholders shown, the projects may agree to allow the EWA to carry indebtedness to the projects into the following year with the expectation that the debt would be repaid without affecting project water supplies.

Table 5
EWA Place Holders for 2005 (in TAF)

Year Type	Purchased EWA Assets [1] Delivered	Estimated Operational (Variable) Assets	Source shift to carry debt if needed	Debt to projects if needed	Total EWA Place Holders
Critical	230	50	100	100	NA
Dry	240	50	100	100	NA
Normal and Wet	240-260	50-150 [2]	100	100	300

(1) Includes added purchases to retire 19 TAF of debt from 2004 operational year
(2) Based on extinguishing EWA debt in San Luis Reservoir in wetter years; actual benefit from operational assets is likely to be limited to about 60 TAF from cancellation of 2004 carryover debt and cancellation of debt from the December 2004 and February 2005 curtailments.

VI. Recap of EWA in 2001-2004

In the first four years the concept of the EWA presented in the CALFED ROD has become a reality in providing additional protection to sensitive Bay/Delta fish species and obtaining the ESA commitments to increase the reliability of the water supplies of the SWP and CVP. Allocations by both SWP and CVP have been unaffected by pumping curtailments at the Delta pumping plants that totaled over 1,000 TAF over the four-year period. Although the EWA has faced many challenges over these past two years, it has been successful in repaying all of the pumping curtailments and avoiding any EWA-induced low point issues in San Luis Reservoir.

Table 6 summarizes the level of EWA purchases and operational (variable) assets that were obtained in 2001-2004. Table 6 also summarizes the actual costs of implementing the EWA. In the first four years the EWA has achieved over 1,050 TAF of fishery actions to better protect fish and purchased over 940 TAF of water to replace the water lost from these actions at a cost of about $110 Million.

The average cost of water was about $179 per acre-foot in 2001, which was a dry year resulting in a 39% allocation by the SWP and a 49% allocation for CVP agricultural users south of Delta. In 2002, a wetter but still a dry-to-below-normal year when allocations of 70% were made by both the SWP and CVP, the average price paid for water was about $118 per acre-foot. In 2003, SWP allocations were raised to 90% in the relatively wet spring, and the EWA paid an average price of $144 per acre-foot. In 2004, EWA paid an average price of $126 per acre-foot in a below normal year with an SWP allocation of 65%.

Table 6
EWA Accounting and Water Cost in Water Years 2001-2004[1]

EWA Assets Acquired	2001	2002	2003	2004a/
Water Purchases	**TAF**	**TAF**	**TAF**	**TAF**
Sources upstream of Delta	105	142	70	120
Sources in export area	231	98	145	35
Total purchases	336	240	215	155
Operational Assets (e.g. E:I flexibility)	48	83	91	<1
Losses b/	-17	-51	-16	-48 c/
Total Net Assets Obtained	**367**	**272**	**290**	**107**
Assets Carried Over from Prior Year		77	58	0
Total Assets Available for WY	**367**	**349**	**348**	**107**
EWA Asset Costs	**TAF**	**TAF**	**TAF**	**TAF**
State	$54.4 M	$17.8 M	$30.1 M	$19.6 M
Federal	$10.0 M d/	$11.5 M	$0 M	$0 M
Total EWA Costs for WY	**$64.4 M**	**$29.3 M**	**$30.1 M**	**$19.6 M**
Average price/acre-foot e/	$179/AF	$118/AF	$ 144/AF	$126/AF
EWA Asset Use				
SWP/CVP pumping reductions				
Chinook salmon / steelhead	86			
Salmonids and delta smelt	137	67	121	
VAMP period	43	45	32	20
Post – VAMP period: delta smelt and Chinook salmon	24	137	195	104
Total EWA pumping reductions for fish protection	**290**	**249**	**348**	**124**
Pumping reduction during conversion of EWA water to project water in San Luis reservoir		38		
Upstream use for Chinook salmon		4		
Total EWA Expenditures for WY	**290**	**291**	**348**	**124**

a/ Numbers for water year 2004 are preliminary and subject to change.

b/ Includes carriage water losses associated with EWA transfers through the Delta, conveyance loss to Delta from San Joaquin River tributary sources, and water lost when spilled from a storage facility due to relatively low priority for the EWA.

[1] Asset accounting is maintained by water year (October 1 – September 30), except that assets purchased in one water year and delivered to the projects in the following water year are credited in the year of purchase.

c/ Based on assumed carriage losses and operational losses in 2004. Of these losses, 19 TAF represents late season releases to the American River to provide habitat enhancement for Chinook salmon; the releases could not be pumped in the Delta.

d/ Amount paid for water purchased by Reclamation initially for CVP purposes and subsequently provided to the EWA.

e/ Average price calculations exclude operational assets.

The decrease in average price from 2001 to 2002 was a result of the wetter hydrologic conditions in 2002, more aggressive negotiations by water acquisition staff, and the fact that first year prices were higher simply because of the short timeline to implement the EWA and purchase large amounts of water. In 2003, the EWA was forced to make most of its purchases south of the Delta, and incurred a higher average cost per acre-foot than 2002 due to restricted cross-Delta transfer capacity. Future prices will reflect hydrologic conditions and competition for limited supplies of water as new buyers enter the market.

During 2002, the water purchase strategy reflected in this document was being developed which refocused the water-buying pattern from that established in the CALFED ROD in an effort to decrease costs. While costs for purchasing assets for the EWA have been within projections prepared in spring and summer of 2000, the approved EWA budget has not been what was requested. Nevertheless, the EWA has been able to stay within its budget each year and has achieved a window of peace in the constant conflict between increased protection of fish in the Bay/Delta Estuary and the reliability of supply of water for uses south and west of the Delta.